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# Introduction to Psychology

## A SYLLABUS

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## FOREWORD

The syllabus outlined here is the result of ten years experience in teaching psychology and educational psychology in normal schools and colleges. The author has found it usually a rather difficult subject, especially for students just out of high school. He early fell into the method of assigning questions and gradually turned from the fact question to the thought-provoking question as the major type. Indebtedness is acknowledged to Professor W. H. Kilpatrick who has demonstrated the value of this method in his courses in the philosophy of education (see his syllabus recently published by the Bureau of Publications, Teachers College, New York City). The Outlines of Economics, by Marshall, Wright, and Field, published by the University of Chicago Press, illustrates its use in another field.

Such a plan finds its corollary in the use of questions following each chapter in textbooks and will in time no doubt be carried out by interspersing the questions in a sort of outline in the body of the text. The absence of an outline of the typical form is due to the fact that the author considers it desirable for the student to make his own outline thereby getting training in organization of material which is invaluable. Moreover each instructor will want to stress different topics and problems and there is greater freedom allowed in this way.

For the content and the point of view, indebtedness is especially acknowledged to Professors Thorndike and Woodworth and to Professor Strong, a pupil of both, whose book, Introductory Psychology for Teachers, has been the most hopeful of all experiments in psychologizing psychology. There is a great deal of borrowing without reference, because the authors who are from time to time referred to have given us notions of such value that they have become incorporated into our thinking. For example, every student and teacher of psychology unwittingly utilizes constantly without recognition the findings of that renowned pioneer of modern psychology, William James.

While there are no doubt inconsistencies, as is characteristic of many of our best texts and as is almost certain to be true in a transitional period in a subject, the author aims at a moderate behavioristic point of view. The time does not seem to have come when we can dispense entirely with the older terminology and many of the contributions of the older school of psychology represented best perhaps by Angell and James. However the author has found some of the behavioristic conceptions very fruitful in his own thinking and that of his pupils, and is inclined to believe that in the next decade or so there will be found a way to harmonize the two somewhat widely divergent schools of present-day psychological thought.

The outline was originally written for the use of students who are just out of high school. The problems are those of general psychology in the main with the emphasis on personal-practical values. This course at the Harrisonburg State Normal School is followed, as seems to be rather typically the case, by a course in educational psychology. There is now available a syllabus in the latter subject by the same author, stressing the learning process and individual differences. Each is a unit by itself and may be used independently. Earlier editions of this syllabus have been used in about equal numbers in normal schools and colleges.

The syllabus was first cast in the printed rather than the mimeographed form because of repeated requests for copies as the result of the fact that at the 1922 session of the Department of Superintendence of the National Education Association, a Committee on Standards and Surveys of the Association of Presidents of State Teachers Colleges announced it as the prize syllabus of those offered for this Committee's consideration. In this third edition a few errors have been eliminated and such additions made as the author believes will make the booklet more usable. He values and has tried to utilize the suggestions made by his fellow-teachers of the subject, especially those who have used the former editions of this syllabus. He covets further criticisms, hoping to make the outline a more valuable tool in the hands of instructors and students alike.

## STATEMENT TO THE STUDENT

This course unlike a good many courses stresses thinking rather than memorization of facts. This latter should follow logically and is provided for in reviews and by a certain amount of paralleling of the first term's work with that of the second. Problem-solving has long been held to be a good method of study, but it is infrequently incorporated into textbooks. Therefore after ten years of trying out various texts, the instructor has devised these questions based on experience and most of them used at some time, hoping the course will be easier, more practicable, more tangible, and better rounded out than otherwise it would be.

**Method of Daily Preparation.** Ordinarily the method of preparation may well include (1) reviewing the previous lesson, writing a brief summary or making an outline, (2) reading the introductory statement of the author, and then (3) reading the exercises. (4) You would then take up the reading or readings and seek to answer the questions and work the exercises. It is an excellent plan to do some reviewing (re-calling or relearning), before the class meets for its recitation.

**Assignments Uneven.** You will find the assignments uneven as it is not possible to find topics of equal value or difficulty for each lesson, or if they could be so weighted for one person they would not be such for another. Consequently, expect to spend more time on one lesson than on another. The instructor does not expect you to spend all your time on this course, but hopes the time will run about as in other courses.

**Ability to Answer Questions.** This will vary much and you may find questions that prove an absolute stumbling-block, others that you are not certain about, and others where you misinterpret the problem and will have to be set right in class. Don't feel that it is your right to come to class unprepared, but do feel that it is the business of the recitation to clear up difficulties.

**Readings.** As students vary greatly in their rate of reading, no absolute requirement in most cases is laid down. No one could read all the references made with each lesson and there is some danger of reading too much as well as of reading too little. The instructor will usually discuss the readings on each topic in advance.

**Note-Taking.** It is probably desirable to take some notes on what you read, at least outside of your text-book. You should, in your reading notes, not fail to give the author credit by noting the name and also preferably the page and chapter of text on the margin or elsewhere. With exercises to guide you, read such references or parts as give you the answers and then stop unless your interest carries you further.

The righthand page was left blank for notes, but to provide sufficient space it would be well to place extra sheets between the pages of the syllabus at the beginning of the course. Leave space in answering for class notes. Your syllabus will be a better permanent possession if, when you unstaple it for your note-book, you protect the eyelets with Dennison rings and put away the cover until you finish the course.

## EXPERIMENT REPORTS: GENERAL DIRECTIONS

**Note.** It is important to learn to report accurately the results and conclusions drawn from a study of anything experimentally whether it be chemistry, biology, or psychology. The following outline is brief and should be followed closely unless the instructor suggests that it is not necessary to do so in the case of a given experiment.

When the instructor returns an experiment or other report to you, place it in the proper place in your note-book.

### Experiment Reports

1. **Statement of the Problem.** This may be and preferably should be in the form of a question which you hope to answer, altho it will not always be easy or worth while to put it in this form.
2. **Materials and Procedure.** If the experiment is at all complex, it is well to divide your statement concerning each of these matters, say by having different paragraphs. If you vary in any respect from the method laid down by the instructor, note it here. You will ordinarily not be censured for such a variation but your conclusions are certain to be different and as a good experimenter you want to be accurate in every detail.
3. **Results.** The results will include all tabulations, charts, and facts that grow out of your experimentation. Sometimes this will require a separate sheet, for example, of graph paper; this should be placed here and not at the end or beginning of your report.
4. **Conclusions.** In this part of the report it is important that you discuss freely the results, using your former reading, introspections, and class discussions where they apply, and that you may note any laws, or applications and interpretations of a practical nature, or any problems that are not answered but are of interest and apparent value. This is the part of the report that requires thought and care ordinarily.

### General Directions

Not always but frequently two people will work together, E the experimenter or one in charge of the experiment and S the subject upon whom the experiment is performed and who observes or introspects. Usually E and S alternate; after the first performance of the experiment they change places and perform it a second time.

Each time before handing in your report make sure of the following items for the sake of uniformity and ease of looking over the papers: (1) that the date and hour and name of the writer-up of the experiment are placed in the upper righthand corner of the sheet, (2) that the name of E and S appear in the lefthand corner and (3) that all sheets of the report be securely fastened together with a pin or paper clip.

## BIBLIOGRAPHY

Note. Only the books frequently referred to are listed here and they are ordinarily referred to with the name of the author only. In case of two texts listed here by the same author, the first letters of the main words of the titles are used in addition to the name of the author, for example, Thorndike (E.P) means Thorndike's Elements of Psychology.

If you find other valuable books or the instructor adds others, they can be placed in this list. It would be an excellent idea to note after the titles of such books as you read, the chapters or parts which you read. This will give you at a glance your own bibliography.

- Angell, Psychology
- Averill, Psychology for Normal Schools
- Bagley, The Educative Process
- Bolton, The Principles of Education
- Cameron, Psychology and the School
- Colvin, The Learning Process
- Colvin and Bagley, Human Behavior
- Dewey, How We Think
- Dewey, Moral Principles in Education
- Freeman, How Children Learn
- James, Brief Course in Psychology
- Norsworthy and Whitley, Psychology of Childhood
- Pillsbury, Essentials of Psychology (revised edition)
- Pyle, Science of Human Nature
- Strayer and Norsworthy, How to Teach
- Strong, Introductory Psychology for Teachers (revised edition)
- Thorndike, Educational Psychology, Briefer Course (B.C.)
- Thorndike, Elements of Psychology (E.P.)
- Thorndike, Original Nature of Man (O.N.)
- Thorndike, Principles of Teaching (P.T.)
- Titchener, Textbook of Psychology
- Warren, Elements of Human Psychology
- Woodworth, Psychology



## CHAPTER I. INTRODUCTION

### Lesson 1. What Psychology is

Our first problem naturally is to find out something about this study which, because it is new and different from anything you have studied before, may seem difficult at first, but which, because it concerns you and your friends, and your future pupils, ought to prove a most interesting and fascinating study. Do not read any of the references until you read thru the questions. Probably the most interesting reference today is that to Strong's Introductory Psychology for Teachers. If you read that, note how he illustrates various kinds or branches of the subject of psychology from stories, newspaper accounts, and similar material to that you are reading every day.

You will do well to take the cue from Strong, and form the habit early of bringing to class materials which you glean in your reading elsewhere which bear upon the problems or topics of this course. The instructor will usually be glad to discuss them and they may be made a part of your note-book.

References: Strong, ch. 1; Pyle, ch. 1; Pillsbury, ch. 1; Warren, ch. 1; Angell, ch. 1; Woodworth, ch. 1; or any other good general text in psychology if these are not available. Exercise 1 below, is adapted from Thorndike, E. P., p. 2.

1. Which of the following terms refer to mental facts? To physical facts? Which may refer to either? How? Gas, tree, sympathy, money, desire, wish, dog, dream, headache, inventiveness, pound, taste, intelligence, heavy, sour, oxygen, fatigue, load, pleasure, remember, image, idea, brain, stone, suggestion.  
To what kind of facts do the following refer: race, fashion, custom, family, government, mob?
2. What is suggested to your mind about the relationship of the three groups of sciences listed below, i. e. how are they dependent upon each other: physiology (and biology), psychology, and sociology? Is psychology likely to utilize, or to be more or less dependent upon the sciences of physiology, chemistry, physics, mathematics?
3. If you read Strong, what do you notice regarding the variety of problems of psychology? What are the kinds of psychology you find in reading this chapter, e. g. animal psychology, adolescent psychology, psychology of advertising, etc.? Can you suggest other branches of the subject?
4. If you were to study and describe a physical object, as for example a river, you might take into account especially its characteristics, its size, its appearance, the composition of its water and so forth; or you might consider on the other hand its functions as illustrated in furnishing water-power and in watering what otherwise would be an arid country. In a somewhat similar way, it is possible to think of the mind or human nature as the sum total of mental processes or states which make it up, or on the other hand to think of it in terms of activity and conduct. Psychologists consequently usually either define psychology as the science of consciousness or of behavior. Which definition fits each notion? What are the limitations of each?
5. If, as Woodworth does, we were to describe psychology as the study of mental life, how does this idea fit in with exercise 1 above? Exercise 3? Does this idea of psychology seem to have advantages over the others suggested in exercise 4? How does it help you to harmonize these two viewpoints? Later on it will be important for you to determine upon a fuller definition of psychology, and one which expresses your views and knowledge of the subject.



## Lesson 2. Methods Used in Psychology

In the first lesson you found out something about the study of psychology; therefore, before you begin the new lesson, write a paragraph of perhaps 100 to 150 words at the end of the class-notes of the last lesson, summing up that lesson, briefly and simply, under the question, "What is Psychology?" Just as that lesson dealt largely with the problem of the subject-matter content of psychology, so this one will deal with the methods used. This is very important because, while a member of this course at least, you are to be a psychologist, and as far as you are able with so little experience and training, you will want to rediscover many of the things discovered by trained students of the subject and, by application of what they have found, to be able to improve your methods of work and study. One aim of your work might be that suggested by Professor Seashore, "Not psychology, but to psychologize." Do not read or study exercise 5 below.

References: Consult the early chapters, usually the first or second of several texts in psychology under the heading "methods" to find their point of view concerning the methods of the subject; Pillsbury, Pyle, Angell, Titchener, Cameron, Averill, Woodworth, Warren.

1. Make a list or table of the methods discussed by the different authors you read, giving credit to each for that which he mentions, and noting agreement and disagreement among them. What seems to be the fundamental difference between psychology and other natural sciences in the matter of method, e. g. chemistry and botany?
2. Titchener says "the method of psychology is observation." How do you tie up with this the methods of introspection and experiment? What are the different kinds of observation?
3. To which type of method is the "behavior" psychologist, who is likely to work with animals, biased? The "consciousness" psychologist? Why? What are the comparative and genetic methods?
4. Whatever methods are being used, there are certain precautions regarding the tabulation of results and their use that must be borne in mind. What are some of these?
5. Class experiments illustrative of psychological method:
  - a. The instructor will display a number of advertisements and the students will arrange them in an order of merit. Why do you place them in this order? That is, what different effect does the best one have upon you? Why do you like one best?
  - b. At a given signal "Go," the instructor will ask you to begin making short vertical marks upon a paper, for a period of one-half minute. How many do you make in comparison with other members of the class? What helping or hindering ideas went thru your mind?
  - c. The instructor will ask 15 or 20 members to stand in a circle so that all are facing clockwise. At a signal "Go" one member will touch the one in front, etc., until the person who began is touched. The instructor will keep the time and the average gives what may be called the simple reaction-time for the average member of the group.
  - d. Which of the above experiments illustrates the method of introspection? Of experiment? Do they form a sort of series as regards methods used?



### Lesson 3. The Major Problems in Psychology

Until very recently, psychologists, as indeed many other people today, thought of the mind as a set of more or less independent functions or faculties, such as memory, reasoning, perception, and so forth. Today we are apt to liken it to a well organized telephone system, with its central, its connecting wires, and its receivers and transmitters. In other words we try to think of it as a unitary machine or organism, now learning, now thinking, now remembering, in rapid succession or indeed perhaps simultaneously. While a flower is no longer a flower when you have taken it to pieces for study in the botany class, and the mind is no longer mind when you analyze it into the functions that make it up, nevertheless we shall have to take up these interrelated and closely interwoven functions separately to come to know something of them in detail. Today we shall make a brief acquaintance with a large number of them in preparation for the more detailed study of the rest of the term.

References: Consult tables of contents or indexes of any one or more of the psychology texts noted in previous lessons. But as usual read the exercises below first. It would be interesting, after studying exercise 1, to pick out the different mental processes in the story given in Colvin and Bagley, pp. 3-4, or to read some colorful poetic or prose selection with this purpose in mind.

1. In the following paragraph is a hypothetical experience, in which a number of these major psychological functions of the mind are found. The words used to indicate them are in bold face, and where they are not used in the text they are listed in parentheses following the phrase or clause of description:

Suppose during a vacation, you are going down town and suddenly as you walk along recalling experiences of the day before (memory), a puff of smoke and a shrill noise (sensation), which you immediately interpret as indications of an incoming train (perception), arrest your attention. You quicken your step at the thought that perhaps some of your friends who are away at school may be returning on this train, and decide (will) to go to the depot in the earnest hope (emotion) that you may meet them. You arrive in time and your curiosity (instinct) is satisfied, but there is no friend. You then turn your steps up the street as you have been accustomed to do many previous times (habit) and are soon at your original destination.

After you have thought over these experiences many of which follow one another in more rapid succession than they can be described and have tried to determine their meaning, turn to some text in psychology and find a psychologist's definition. Couch each in as simple terms as possible and give credit to the author in your notes. Perhaps the following order would be best; instinct, habit, emotion, sensation, perception, attention, memory, thought, will or volition. The following form of brief description might be used:—"Instincts are.....

.....: illustration,.....

2. Similarly try to break up or analyze some one or more of the following or kindred experiences: (a) sitting in the classroom when someone is reciting or the teacher is lecturing, (b) at the breakfast table, or (c) at the study desk with perhaps your history text open before you noting which of the mental functions listed in 1 above are to be found, and what others. Write up your experience to hand in, beginning somewhat as follows: "While sitting at my desk at half past eight o'clock.....," and following the plan of the illustration above.

As this is your first experience in handing in work, establish the habit of indicating the lesson and exercise, as follows—Lesson 3, ex. 2.



#### Lesson 4. Situation, Bond, and Response

Before we turn to the detailed study of these large problems, it seems important to get a point of view that has recently come into psychology, and that will undoubtedly help you to keep in mind this unitary nature of mental life as we work with the different mental processes. That point of view is that all mental life or consciousness or behavior, may be thought of as being comprised of situations or stimuli (singular, stimulus), and bonds or connections, and responses or reactions. We shall use the letters, S, B, and R, to denote these and try today to get a preliminary view of these terms and their meanings. This lesson should be of special profit to you if you apply the idea to what you do in study or recitation or at any time during your waking life or indeed in your dream life, that is, that always you are reacting to situations presented and that you are reacting in one way and not another because certain bonds have been inherited or learned.

References: Freeman, ch. 1; Warren, ch. 3; Woodworth, chs. 2-4; Strong, chs. 2, 3. Unfortunately, there are few good references on this subject but that may make it all the more interesting if you will follow thru the problems suggested below. Most recent texts treat these topics briefly.

1. If someone should make a thrust at your face, you would wink. Similarly, if when you have your knees crossed, some one should strike the upper knee, the foot would fly up. What is S and what is R in each case? Do you also get a notion of what B is like?
2. When you are called upon in this class (S) and make answer (R), what do you notice about S compared with S in 1 above? Name in detail in this case all the things that go to make up the S. Is the R similarly complex? Are most S's and R's complex or simple?
3. In the following illustrations, note wherever possible, what, if any, of the mental functions discussed in Lesson 3 are present, e. g. if one unexpectedly comes upon an old friend (perception), one is first struck with surprise (emotion) and then reaches out the hand in greeting (habit):

Situation	Responses
Person hears loud noise	Person thinks "thunder"
Pupil sees word "s-c-h-o-o-l"	Pupil thinks "school"
Person hears loud noise	Person jumps
Teacher calls pupil's name	Pupil goes to board
Person thinks of mail	Person goes to postoffice box
Person sees approaching auto	Person steps back in fear

4. The connections between S's and R's are called B's. What is the difference between the bonds in 1 and in 3 above, i. e. which are learned and which do not need to be learned? Try now to state the meaning of the terms S, R, and B.
5. What is teaching, and what is learning, in terms of these three words or concepts? What, in these terms also, is the purpose of the classroom recitation?
6. Now look back to your summary of Lesson 1 and see how you might profitably supplement it or change it to incorporate this new idea of mental life. Can you take a given period of your life, say five minutes of the classroom period, and analyze it into the S's and R's that go to make it up? (See Lesson 5, exercise 2).



## Lesson 5. Review

As far as possible it will be important for you to proceed in this course according to the recognized laws and principles of psychology. Information to be usable must not only be learned but reviewed or relearned. It is going to be a valuable thing for you at this time to see (1) how quickly and fully you recognize the points which you have taken up and learned in preceding lessons, (2) how difficult or easy these principles or facts now seem to you as compared with the first time you came upon them in your reading or class discussion, and (3) how well you have formed the habit of keeping your readings and other work up-to-date. If you have never tried the habit, it will be very much worth while to make an effort now to substitute for last-minute preparation of your psychology lesson, the practice of studying it immediately after your recitation (or as shortly after as you have time). What has this suggestion to do with the matter of learning as making bonds? Are you forming the habit of keeping your notes up-to-date?

1. Make up an outline-digest of the material covered thus far in the course. It can follow fairly closely the outlines of the preceding lessons and should not have too many main topics. The instructor will be of any help he can in shaping this up after you come to class. By the term digest, is meant the idea that an outline, to be useful, can not be a mere skeleton, but should include descriptive phrases and clauses, e. g., if you wanted to include the topic, "Two opposing views of psychology," you would not follow this simply with "(a) consciousness and (b) behavior," but rather with "(a) consciousness: the description of the contents of mind, its different processes, (b) behavior:....."
2. As a supplement especially to lesson 4, and a review (this word means a new view), write to hand in, a list of 20 situations and their appropriate responses, as in exercise 3, Lesson 4. It would be valuable if you would make a few of these apply to preceding lessons, e. g. "Hear the word situation—Think of psychology class." Or it would be excellent to select experiences out of your daily life, securing as much variety as time allows.



## CHAPTER II. PHYSICAL BASIS OF MENTAL LIFE

### Lesson 6. Relation of Mind and Body: Nervous System, Neurone, Synapse

The purpose of this and the next two lessons is to give you a working notion of the physical basis or background of your mental life. It may seem to you that it is really a study of physiology, but it is rather physiological psychology. Probably it could have been omitted or placed differently in the course but the author's experience is that it proves helpful to have this background early if it is not made too detailed or technical. Just as one is better able to understand the products of a country if one understands the physical conditions underlying those products, the nature of the soil, the rock formation, the direction and nature of the winds, so you will understand memory, perception, and thought better if you get a few accurate notions about the nervous system and its functioning.

It will be valuable for you to begin at this time outlining your lessons either before or after the recitation or both, and it may be very much worth while to continue making the brief paragraph summaries. It may be that one will be sufficient.

References: While practically all elementary texts in psychology have chapters on the nervous system, it may be best for every one during these next three periods, to make use largely of the following: Strong, chs. 51-58; Angell, ch. 2; Pillsbury, ch. 2, ch. 3 (pp. 49-57); Thorndike, E. P., pp. 120-162 (excellent cuts); Woodworth, ch. 2; Warren, ch. 20. If you want a brief statement before you begin the longer discussion, see Cameron, ch. 2, or Averill, ch. 3.

1. Can you imagine a body without a mind or a mind without a body? What is the relationship of the two? What evidence have we that the mind depends upon physical structures?
2. What is that part of the body called which forms the physical basis of mental life (consciousness, behavior)? What are the main parts? What may be said to be its main functions? Explain this last in terms of S, R, B, if possible.
3. What are the general physical characteristics of each of the nerve cells, or neurones? Be able to draw at least three dissimilar types and label the parts.
4. How are functions of the nerve cells unlike and how like those of other cells? Into what three general classes are the neurones divided according to function, and where is each largely located?
5. What is the nervous current? What are the important facts about it, its rate, its paths, etc.?
6. What is the synapse? Describe and diagram it. Note in this connection, the probable function of each part of the neurone. What is the relation of the synapse to the bond (B)? Does it appear that the notion of bond is as important as those of stimulus and response? Apply the concept of the synapse to the illustrations in lesson 4, exs. 1-3.



## Lesson 7. The Three Levels of Response

In the last lesson we saw how the central nervous system is the basis of mental life, how it is composed of simple elements (the nerve cells), and how they join at the synapse, thus making possible the transmission of the nervous impulse. Today we shall study action or behavior, some of it not ordinarily conscious, and some of it representing the most complicated acts that the human organism can perform. Do not expect to be able to answer all of the questions without reading.

References: See lesson 6. Also Woodworth, ch. 3; Strong, chs. 51, 57; Warren, p. 37.

1. If you prick your hand slightly, it will be withdrawn involuntarily thru reflex action, the control being on the lower level and thru the spinal cord. Show how in turn (a) the mind-brain and (b) the cerebrum become involved when (a) the prick is severe enough that you are led to make a more vigorous response bringing into play other parts of the body, and (b) still more severe so that you look at the injured spot, consciously try to remove the offending object, and may even consider further the question of the possibility of poison from it (Strong, Book II, p. 193). What are these three levels called and what distinguishes each from the other? Is it probable that within the highest level, there are really several levels?
2. Make an effort to find several illustrations of response on each of these three levels.
3. Diagram each level in general terms or with the illustrations of exercise 1 in mind.
4. Be ready to discuss the following statements:
  - i. Responses of the lower level are inherited or unlearned;
  - ii. Responses of the second level are probably also unlearned, but may depend in part, upon learning, e. g. co-ordinated responses;
  - iii. Responses of the third level have to do with learning and complex movements and include, therefore, the most automatic habits as well as the most elaborate reasoning.
5. There are two conceptions you are apt to come across that it may be important to note before we leave this topic. (i) A number of the behaviorists are inclined to the view that all higher mental responses—memories, perceptions, sentiments, thoughts—are composed of simple reflexes. (ii) In popular psychology, one frequently notes a confusion between inborn reflexes and mechanical habits, as for example the writing of an experienced typist, and the notion that in the latter case as in the former, the control is on the lower levels. . . What are your reactions to each of these concepts? What facts seem to refute the first? What the second?



## Lesson 8. Cerebral Activity: Review

In preparing for today's study, go back over the main concepts you have been thinking about in the two previous lessons, the nature and function of the central nervous system, the neurone and its structure and functions, the synapse, and the three levels of response. Bring to class any questions about matters that are not clear, as they will prove real stumbling blocks in the future. Today we shall concern ourselves particularly with mental life (behavior, consciousness) of the third level. You will bring to class to hand in, one diagram under exercise 1 and one diagram under exercise 2, and on a separate sheet, an answer to question 4. The instructor will explain and illustrate 2 before you begin your work, that is, in the assignment.

References: See lesson 6. Woodworth, ch. 3; Warren, p. 4; Strong, chs. 51, 58.

1. Draw a rough diagram of the exterior of the left hemisphere of the cerebrum, and locate the two great fissures, and the more certainly localized areas as to function, e. g. visual, motor, tactual, and auditory. It will help you to remember these locations if you will run the hand over the side of the skull as you study the diagram. (A model will be brought to class).
2. Diagram as accurately as is possible one or more of the following, and be able to describe in the large the brain action that takes place:
  - i. Copying a sentence with a pencil,
  - ii. Sewing a rather difficult stitch by hand,
  - iii. Reading a sentence aloud,
  - iv. Speaking,
  - v. Playing the piano by note,
  - vi. Answering a question asked by the instructor.
3. What are the physiological aspects of situation, bond, and response (S, B, and R)? (Strong, Book II, pp. 204, 225). State carefully and rather fully what is meant by each of these terms. Do you feel that you understand better the problems raised in Chapter I, especially in lessons 3-5? Are you using these concepts in your daily observation and thinking?
4. Since this is a difficult subject and because the habit is one worth your cultivating, make an outline-digest of Chapter II, using the same title. However feel free to change the organization to suit your needs. Take care that the emphasis is not so much upon the physiology as upon the bearing of the facts of physiology upon mental life.



## CHAPTER III. ORIGINAL NATURE: HEREDITY, INSTINCTS, EMOTIONS

Before beginning this new topic, take a couple of minutes to note the "Statement to the Student" at the beginning of this syllabus and to raise the question as to what part, if any, you have been slighting. Has your instructor also apparently neglected to bear any part of it in mind?

### Lesson 9. Heredity: Its Laws and Contributions

In this lesson the purpose will be served if you gain a clear notion of the importance of heredity, that stock of original nature with which we humans start in life. The two factors, heredity and environment, "nature and nurture," are responsible for the vast multitude of responses that we make daily. In most cases they are so complicated and the effects of heredity and environment are so intertwined that it is hard to distinguish them. The practice of trying, however, is excellent, as it leads one to appreciate each the more. It might be said in this connection, that there was at one time a considerable controversy as to which was more important, but this is hardly a valuable question, altho you will probably find yourself leaning to one or the other, heredity or environment.

References: Perhaps the best available reference is Norsworthy and Whitley, ch. 1. Other references are: Pyle, ch. 2; Woodworth, chs. 4, 5; Averill, chs. 4-6; Thorndike, B. C., ch. 1; Strong (see index).

1. Write out to hand in, a list of say half a dozen physical traits in yourself and others, such as brown eyes, red hair, short-fingeredness, unusual height, etc., and in a parallel column, the ancestor or parent to whom this seems to be traceable.
2. Make a similar table to hand in, trying to be rather more careful of your facts, of mental traits, e. g. musical ability, inventiveness, excellent memory, etc.
3. In such common habits as eating, walking, talking, and observing things as you pass along the street, can you trace to some extent at least, the inherited and acquired responses?
4. What is the difference between blended and alternate inheritance? Cite illustrations. Which do you think is probably more important?
5. The hereditary contributions seem to be from three sources, race, sex, and family (or near ancestry). Can you suggest illustrations of each? What is the value to a teacher, of the hypothesis, "Given a white boy of the Hugh Smith family," . . . i. e. can certain conclusions be drawn about the child's probable school achievements?
6. If the father in this case is a well-educated lawyer with a special interest in social welfare in his community, will these acquisitions affect the son's original nature? Why? What is the value of this fact and the knowledge of it to the teacher?
7. It seems to be proved that the line of inheritance is thru the germ plasm which is quite distinct from the body plasm and that the individual's abilities are determined at the time of the fertilization of the ovum. What importance has this fact for the minister, the teacher, the social worker, in fact, any leader in society?
8. Of the two great laws of heredity that of resemblance, and of variation, one forms the basis of general psychology and the other of individual (differential) psychology. Which must this course largely take up? Why is the other very important for the parent and teacher?



## Lesson 10. Instincts and Their Place in Education

This lesson will introduce you to the general problems of instincts and their treatment, so that nature may become nurture to the greatest advantage to the individual and the race. As you study, try to keep in mind your own experiences and to review your own education in and out of school, and also to think of the activities of younger children of your acquaintance. This lesson will be continued in the next, but with reference to special instincts, and the subject will be taken up again more fully in the course in educational psychology.

While psychologists have recently come to the conclusion that such general terms as curiosity, pugnacity, etc., are really group names for scores or even hundreds of specialized tendencies, it will be easier if we bear this in mind but follow the general practice of using the older terminology. Bear in mind the fact that instincts are situation-bond-response combinations that are formed or partially formed thru heredity.

References: It will be well to read one of the following references only, the rest being given to offer opportunity to find the list of instincts which is called for in Lesson 13: Pillsbury, ch. 10; Norsworthy and Whitley, pp. 21-31; Pyle ch. 4; Angell, ch. 15; James, ch. 25; Thorndike, P. T. ch. 3; Bolton, pp. 140-164; Colvin, pp. 33-63; Woodworth, chs. 5, 6, 8; Warren, ch. 10; Strong, chs. 33, 34.

1. Do humans have less or more native tendencies than the lower animals? What is the more important difference between them? Illustrate.
2. Explain briefly the origin or source of instincts according to the biological law of natural selection?
3. If a boy is intentionally injured by another, what does he instinctively do? If he fails to make this response, what may be the cause? Does a soldier instinctively salute his officer?
4. Make a list of the differences between reflexes, instincts and capacities, and find several illustrations of each. Which of these are more educable? Which may be ends as well as means in education? What are some of the other terms used to denote native tendencies?
5. What are the traits or characteristics common to human instincts? What is the significance of each for education?
6. What are the various methods that may be used in handling (a) the less desirable and (b) the more desirable instincts in home and school? What are the relative merits of these methods?
7. From what you have learned thru the above, what would you say as to the value of the instincts in the adaptation of the individual to his environment? (See Colvin and Bagley, p. 128).
8. List a half dozen instincts which you have exhibited during the last twenty-four hours. Which are more like original nature and which have been most overlaid with habit?
9. Begin a list of human instincts which are of more or less importance in education, not including the reflexes and not including highly specialized and individualized capacities, to be handed in with lesson 13.



## Lesson 11. Some Important Instincts

The teacher and the parent, as well as others interested in problems of social leadership, find themselves confronted constantly with the problem of utilizing the tendencies, which we find in children, and this lesson serves the purpose of giving you opportunity to find out some of the methods of utilizing a few of the most important instincts. In this lesson, do not neglect to find out something about each instinct in addition to answering the questions asked, so that if you were asked to give a brief description of it you could do so. Furthermore, this seems important at this point because it will set you thinking about the relation of psychology to teaching, and because it will give many suggestions regarding yourself and cues as to what to look for and interest yourself in, in psychologizing. The instructor will probably want to spend two periods with this lesson or to omit some of the exercises. If desirable, the applications to education can be ignored.

References: See Lesson 10. Also Angell, ch. 16; Norsworthy and Whitley, chs. 3-5; Averill, chs. 6-18; Colvin, pp. 55-63; Woodworth, ch. 7; Thorndike, B. C., chs. 2-5; Freeman, chs. 5-8.

1. Take some two or more instincts, e. g. fighting, and indicate carefully the S's and R's of which their appearance is made up.
2. Can you suggest important uses for the following instincts in the school, particularly in the grade of work in which you are interested; fighting, collecting, desire of approval, migratory instinct, leadership, parental instinct, sex instinct?
3. In what sense is imitation not an instinct? Note the diversity of activities included under it, that is, of kinds of imitation. Give illustrations of how imitation may be important and valuable and how it may be unfortunate in the second grade, the eighth grade? How does imitation change with age?
4. How can we use the tendency to physical activity? To mental activity? which is relatively more important in the kindergarten? In the high school? What course in school may be said to be based largely upon each?
5. Is the curiosity of the 2-year-old child, the 8-year-old child, the 16-year-old child, different in important respects? How? How can the elementary school make wider use of this important instinct?
6. Why and how is rivalry frequently misused in school? What are at least two important changes in the modern school in the use of rivalry (emulation)? Can you cite good illustrations of use of this instinct?
7. Is there a "social" instinct? Is it the instinct of gregariousness or the gang instinct? At what stages of education is this most important and how can it be best utilized? Cf. first, fifth, and tenth grades.
8. Play has been called the most fundamental instinct for education. Justify this statement if you believe it, and show two extreme viewpoints regarding play and the school and the desirable middle road.
9. Speech or language is based upon the instinct of vocalization. How is learning to talk a matter largely of imitations? What are common errors that need to be corrected in elementary instruction and how do you know they are errors?
10. Take up at least one subject of the typical primary, or grammar grade, or high school course, and show what natural tendencies might advantageously be relied upon by the teacher as furnishing motive-power. Write this out to hand in.



## Lesson 12. The Emotions, Feelings, and Attitudes

In this lesson you will study a kindred topic to that of the last two lessons, namely the emotions. Like the instincts, they are built upon the solid foundation of heredity, but they are capable of much development. Attitudes, moods, and the higher emotions are probably very largely a matter of education and training (environment). Some one has said that the feelings (emotions) are the "mainsprings of life." While therefore the psychologists have not been able as yet to make exact studies of them, for when one tries to study a feeling it disappears from consciousness, yet it is important to get acquainted with the data available on this interesting phase of ourselves.

References: Norsworthy and Whitley, ch. 5; Pillsbury, chs. 11, 12; Thorndike, P. T., ch. 12; Colvin and Bagley, pp. 79-84; Bolton, ch. 25; Titchener, pp. 471-503; Woodworth, chs. 7, 8, 9; Strong (see index); Warren, ch. 9; Angell, chs. 18, 19.

1. When one is angry, he may or may not strike the object of his anger but he is certain to feel angry. What seems to be the relation of emotion and instinct? How might you define emotion?
2. An emotion is always attended by much physical and organic activity. What are some of these activities in the case of extreme fear or extreme anger? Is this an important fact for the parent and teacher to bear in mind? Why?
3. What is feeling (or affection) according to the psychologist? What is its place in emotion? How might you define emotion?
4. What is meant by calling fear and anger, primary emotions, and hate and disappointment, higher or compound emotions? These latter may also be spoken of under such heads as esthetic, intellectual, moral, religious, social emotions. Can you illustrate each of these groups? Try similarly to define and illustrate attitudes, moods, sentiments, and ideals. What is temperament?
5. Recall some strong emotion which you may have had. How did it affect the clarity and accuracy of your thinking, the accuracy and effectiveness of your action? Would this hold generally? What of attitudes and moods? What similarly is the effect of clear thought and definite action upon an emotion?
6. Apply the methods of handling instincts (Lesson 10, exercise 6), to two emotions, either anger or fear, and either sympathy or reverence, or courage or happiness. What are the means to emotional training? What are the real value and purposes of emotional training?
7. Begin a list of human emotions, which will be supplemented in the class discussion and will be completed with Lesson 13.



### Lesson 13. Review of Lessons 1-12

In Lesson 5 you saw the advantage of freshening up your information and of checking up on your acquired stock of ideas about psychology. This lesson is given at this time to assist you further in the same matters as there is a rather definite break in the subject matter at this point. In all likelihood the instructor will want to set a written lesson or test over this matter, on account of the peculiar advantage such an exercise has in giving the teacher a chance to note the nature of the responses of the pupils when he tries to give all a fairly uniform situation. Therefore, some of the questions may be like exercises 1-3, where the opportunity of making the situation uniform for all is greater than in such questions as "discuss" or "state." In answering these be entirely self-reliant the first time and then check up on the answers by reference to your notes, your favorite texts, or your room-mate, and make a score of the number of correct answers that you made. Write out and hand in answers to question 4 on one sheet and question 5 on another sheet.

1. Psychology is today usually defined either as the study of ..... or of ..... A somewhat broader statement of its aim is that it is the study of ..... Its general method like that of all natural science is ..... which, when focused on one's self and one's own mind, is called .....
2. The modern psychologist thinks of all the various mental processes as being reducible to stimuli or ..... and to ..... or responses. The connections between these are known as ..... Learning may therefore be defined as the forming of ..... teaching as the provision of the situations which will secure ..... responses.
3. The individual both mentally and physically is a result of heredity and ..... The former factor is seen clearly in two great groups of mental processes, the ..... which usually involve action and the ..... which involve more of the feelings. The best method for the treatment of the undesirable tendencies is ..... while the home and school must provide for wise ..... of the desirable ones.
4. List the books you have been using rather frequently, in an order to preference, stating either the quality you like about each, or giving some reason for your preference.
5. Complete (a) the list of human instincts and (b) the list of human emotions which you began in previous lessons. It might be well to limit yourself somewhat, say to twenty of the most important instincts (i. e. group names of natural tendencies) and twenty of the most important emotions.
6. What help do you find that you are getting from this course in psychology for your own personal life? Can you suggest ways in which it could be made more helpful by the instructor?
7. Write out to hand in a paragraph on the topic, "My reactions to psychology", without giving the matter any study, writing rapidly, frankly, and freely the things you think and feel about the subject at this time.



## CHAPTER IV. ATTENTION AND INTEREST

### Lesson 14. Nature of Attention

We now turn for three lessons to the related problems of attention and interest. You have noticed many times how teachers, parents and others insist upon attention in dealing with children and inferiors. It must be important, therefore. You have also learned by experience, that you learn more easily when attention and interest combine to assist you. In this lesson the general nature of the attention processes is treated and you will notice that we now turn, as the scientist must sooner or later do, to the statement of some of the laws of psychology.

As you study, watch carefully your own attention. There are few people who cannot improve their habits of concentration of attention. This is not the only test of a good student but is one of the important tests of character, because attention underlies not only habit-formation but reasoning and volition (will).

References: Norsworthy and Whitley, ch. 6; Pillsbury, ch. 5; colvin and Bagley, pp. 54-62; Colvin, pp. 251-270; Strayer and Norsworthy, ch. 3; Averill, chs. 34, 35; Angell, pp. 80-113; Woodworth, ch. 11; Strong, Book II, pp. 9-10, 95-98.

1. If you have ever watched a baby of a few months, you will have noticed his giving attention to various features of his environment and you may have noticed and apparent parallel in his general mental development. Are there instinctive tendencies to attentiveness? To what sorts of things does a little child seem instinctively to attend? Note the motor accompaniments of its attention. Do these persist with the adult?
2. Familiarize yourself with some discussion of attention so that you can illustrate it with some diagram, and explain that diagram, e. g. the concentric circles. What is then the concentration of attention? Inattention? Dispersed attention?
3. Remembering, therefore, that the psychologist believes the mind is always attentive or that attention is a feature of all conscious acts, which is a good definition of attention, or, better still, a brief description of attention that will take the place of a definition? Is there one essential characteristic of attention?
4. Be able to define and illustrate the following terms which represent aspects of the attention process; duration (rhythm) of attention, span or range of attention, division of attention, distraction of attention. In this connection it is important to note the differences in these matters between children and adults.



## Lesson 15. Nature of Attention (Continued)

As this lesson is a continuation of lesson 14, see the introductory statement to that lesson. Before writing up the experiments it will be imperative to look up the introductory statement about "Experiment Reports," and it will be equally important at this point to sketch again the "Statement to the Student."

References: See Lesson 14.

1. Be careful to perform the following experiments rigidly so that your results will be accurate. This means keeping the directions listed in "Experiment Reports" before you, and recording results and introspections at once. Keep careful records of all 4 experiments and hand in report of one of the first three.
  - i. **Rhythm (duration) of attention**—Let one member of the pair listen attentively to the sound of a just audible watch, and respond to the fact of the loss of the sound by lowering a pencil held in the hand, holding it upright when the sound is heard. Let the other member record in the listener's notebook a series of dots at as nearly a uniform rate as follows . . . . . , and interpret the result.
  - ii. **Span or range of attention**—Let E take several slips of paper of uniform size, say 3 or 4 inches square, and place on them in irregular arrangements dots of uniform size, from 4 to 12 in number. Shuffle these into an irregular order and then expose them one at a time to S, for the briefest interval possible for him to estimate the number. If time allows, rearrange the slips and expose each a second time, keeping the record of the guesses. What is S's attention (or perception) span? Is it hard to keep from counting? Does memory enter in?
  - iii. **Division of attention**—Let E hold a watch with a second hand and let S in five successive trials, perform the two-fold task of counting for one minute as rapidly as possible, and of writing the Arabic numerals, 1, 2, 3, etc., of the same series as fast as possible. He must not allow his writing to slow down the counting so that he does not keep ahead. Record introspections, i. e., inhibitions, etc. Note what gain, if any, comes with practice, and in the result record scores in both ways of counting. What conclusions do you draw from the test, as to one's ability to attend to two things at once? Cf. other experiences.
  - iv. **Distraction of attention**—Select a passage of some fifteen or twenty lines of printed matter, pick out and check the a's, or pick out some combination of letters, such as er. Immediately after the task record introspections of your consciousness during the act of counting and indicate irrelevant impressions, memories, thoughts, etc. What conclusions do you draw?
2. State laws regarding each of the terms listed in question 4 of lesson 14, and with which you have experimented in question 1 of this lesson. If you draw upon some author give him credit, but you can as well state them yourself, perhaps. There is probably a general law of attention or law of selection; see exercises 2 and 3 of lesson 14. Can you state this? There are undoubtedly a good many other laws regarding attention and you may if you desire, state any of those. A good method would be as follows: Law of repetition—The repetition of any experience tends to increase its clearness up to a certain point.



## Lesson 16. Attention and Interest: Practical application

In the last two lessons, by reading and experimentation, you aimed to find out some of the more important characteristics of the mental processes grouped under the head of attention. It would be unsatisfactory to leave this lesson until you have outlined or summarized lessons 14, 15, and 16.

In this lesson we shall study the practical bearings of attention upon your work as a student and as a prospective teacher. Just as therefore, in the last lesson, you gave attention (note how quite by accident I used the word, but nevertheless used it properly) to the laws of attention, today you will be asked naturally to begin to form practical conclusions in the way of maxims or rules of practice.

References: See lesson 14. For a discussion of interest, see Dewey, Interest and Effort in Education.

1. Psychologists are fairly well agreed that there are three different types of attention, but they are not agreed upon the names. Find out what you can about these and consider the desirability of the following names: primary (or spontaneous), secondary (or forced), and derived primary (or sustained). Be able to illustrate each from your own recent experience, or better still, write up an experience in which the three kinds of attention are found.
2. Among the qualities of stimuli that attract attention are clearness, intensity, novelty, pleasurableness and expectedness. Which of these are more likely to be connected with each of the three types of attention? Which should a teacher always seek in situations which he presents to the pupil? Which should he use sparingly? Which have to do with the importance of stating the aim of the lesson? Which lose their value with excessive use.? (cf. Thorndike, P. T., p. 107).
3. Does interest depend upon knowledge? Do attention and interest always go together? What is interest? When, therefore, is a thing interesting? Can all school matters be made interesting? If not intrinsically interesting, what can be done to secure interest?
4. Interests are in immediate or remote ends. Which are more appealing to little children? Why? What then must the teacher do? Can you cite misuse of this fact in your school experience?
5. Try to analyze your classroom experience, in the elementary school, high school, and normal school, noting the things that have been the occasion of your lagging interest and attention. Write a paragraph under the caption or title, "Why my attention lags in class?" or list the situations in which attention lags.
6. State at least three or four very practical maxims for the teacher that grow out of the exercises in these three lessons on attention and interest, for example, regarding the concentration of attention.



## CHAPTER V. SENSE-PERCEPTION

### Lesson 17. Sensation: Illustration of Touch (Cutaneous) Sensations

Psychologists who have had the consciousness rather than the behavior point of view have usually given much stress to this subject, because they regarded sensations as the elements out of which the other higher processes are made. The behaviorist is inclined to class sensory impressions with the native tendencies. It will be sufficient if you grasp at this time, the notions of the variety and richness of sensory experience, and its general nature and significance. You may if you like, look into the physiology of the eye and ear and other sense-organs. There are no physical structures more complex and wonderful except the brain itself.

References: Pillsbury, ch. 4; Strong, chs. 52, 53; Colvin, ch. 4; Norsworthy and Whitley, ch. 7; Pyle, ch. 3; Woodworth, ch. 10; Warren, chs. 4, 5; Angell, ch. 5.

1. As you sit at your desk now, in what ways is your nervous system being affected (stimulated) by the outside world, or internally, e. g. by the page before you, perhaps by a toothache, by noise or talking, etc.? Note the variety of situations and of sense-organs involved.
2. Study the terms sensation and perception and find the difference. What do some writers mean by the terms pure sensation, elementary sensation, simple sensation? Justify the title sense-perception at the heading of this chapter? Arrange the following in a series, noting which you think at one extremity, are more like illustrations of "pure" sensation and at the other, complex perceptions; sight of friend, baby's feelings when burned, sound of tuning-fork, unfamiliar selection on victrola. Give other illustrations of difference but likeness of these two terms.
3. Touch (popularly mis-named "feeling") is a complex of at least four senses, pressure, warmth, cold and pain. Perform and write up carefully the following experiment to hand in:

Measure off on the back of the left hand (or right hand if you are naturally left handed), a square approximately a square inch, and divide same into four fairly equal squares. Make a similar plot on paper, preferably four times as large, that is two inches on the side. (Practice each of the four parts of the experiment briefly on some other part of the hand lest you fatigue the area marked off).

i. Take a fairly well sharpened lead pencil or nail and explore the whole area systematically beginning on one side and running on parallel lines, noting cold spots and marking same in the proper place on the diagram.

ii. Similarly, take a heated pencil or similar object and explore as before for warm spots. As before, note spots but with a different symbol.

iii. Take a stiff hair or bristle or sharp pencil and explore for pain spots, and mark with a third kind of mark.

iv. Take a sharp pencil, sharpened toothpick or very stiff bristle and explore especially at the roots of hairs for pressure spots and note on diagram.

Note. In your write-up, cover any other important details, especially in the nature of introspections, but do not neglect to answer the following questions:

a. Which of these four kinds of sensations is easiest to locate? Which is hardest? How many of each did you find? b. Did you notice any other skin responses that might be taken for sensations? Name them. c. What is the value to man of these sensations? Is their value more to civilized man today or savage man? To the little child or adult, relatively? Why? d. What general notions do you draw from this experiment that change your former views as to the number of senses?



## Lesson 18. Visual, Auditory, and Other Sensations

Today we are to study other types of sensations. A part of the class-work may be given to working out the details of a table listing the sense-organs (or receptors), the senses, and the varied stimuli that give rise to these responses. There are numerous interesting experiments which you will find suggested to you, for example in Strong, Pyle, Pillsbury, Woodworth, and Seashore, and which you may care to try. You will want to note rather carefully the number of the senses or kinds of sensory experience. If the instructor desires, exercises 2, 3, and 7 might be omitted or the whole lesson may be focused in one or two problems. On the other hand if time permits, there is an abundance of interesting data that would make it possible to expand this lesson into several lessons.

References: See lesson 17.

1. Visual sensations are of two kinds, color (chromatic) and brightness (achromatic). Find out the different stimuli of each, the number of qualities and be able to draw and explain the color pyramid (Pillsbury, Angell, or Titchener), or color cone (Woodworth).
2. Explain and be able to illustrate and note any practical implications of any of the following features of visual sensations: negative and positive after-images, complementary colors, visual contrast, adaptation.
3. Suppose some one were to hold a color before your eyes. Describe the complete details of the situation and response, from the moment of the reception of the stimulus to the final answer by naming the color. If you will actually perform the experiment, you can supplement this account with some very interesting introspections.
4. Auditory sensations are likewise of two kinds, tone and noise. Find out the difference in stimuli and variety of qualities of each. What seems to be the best or most acceptable theory, explaining auditory sensations?
5. Find out something about the following sensations and be able to illustrate them or give a simple experiment for locating them: olfactory (smell), gustatory (taste), static, kinesthetic, organic. Do you find other names of sensations suggested?
6. Which of the sensations seem to develop first in the little child? Which later? Which two are most used in education? Are we tending to stress others in education today, e. g. kinesthetic? How?
7. List sense defects which are likely to be a serious handicap to the child in school. Which of these are curable? Remediable, at least by artificial means? Which neither remediable or curable?



## Lesson 19. Perception

You have just learned that sensations are primary or elementary experiences, somewhat as are feelings, instincts and reflexes. We seem as adults, seldom, if ever, to have such simple experiences, as they occur in connection with each other or with still other experiences. The most natural and common complex experiences with which sensations are allied or of which they form a part, are perhaps perceptions (percepts). Woodworth suggests that sensation is the first response, and perception the second. While the following mathematical proportion is not exact and must not be taken too literally, not its meaning—Sensation: perception:: reflex: instinct: feeling: emotion. A rich perceptual experience is now recognized as being very important in education.

References: Pillsbury, ch. 7; Norsworthy and Whitley, ch. 7; Colvin, ch. 6; Woodworth, ch. 17; Warren, ch. 7; Angell, ch. 6; Strong, ch. 45.

1. What is apparently sensation and what perception in the following experiences: seeing a horse, hearing an automobile, tasting an orange? How many and what sensations might have gone together or have fused to give you your present percept of apple? What else enters in? Can you judge from these questions how a full-fledged mature percept is probably formed, so that you habitually recognize an object when it is presented to your attention?
2. Errors in perception are commonly known as illusions. Note what is the cause of the illusion in the illustrations below:
  - i. Proofreaders' illusion—Peyshology, if read rapidly in a sentence, would probably be read psychology. Why? Did you so read it?
  - ii. Artistotle's illusion—Cross two fingers, placing a marble or pencil between them, so that it touches what otherwise would be opposite sides of the fingers. How many objects do you feel?
  - iii. Muller-Lyer illusion—Consult some text (e. g. Pillsbury).
  - iv. Try to explain other illusions, e. g. hearing a burglar when alone, seeing a ghost, thinking the wrong train is moving, etc.
  - v. Do illusions enter into reading, spelling, etc.? Illustrate.
3. Reading, one of the most important school exercises if not the most important, involves perception very largely (see Pillsbury, pp. 192-5). Watch the eyes of some one reading the lines of this page and record the number of fixations made per line. Pillsbury notes three kinds of reading, by letter, by word, and by idea; be able to discuss these and note their use and relative importance. Is there a general law of perception applicable to each type of reading? Suggest other activities similar to reading in having such a hierarchy of perceptual habits.
4. In concluding this study of sense-perception it would be well to write out an outline or a brief summary of the whole discussion. Add some statement of the importance of perception in the newer educational practice, e. g. in teaching arithmetic, history, language, etc., or state three or four of the most important rules to guide the student and teacher in the use of concrete material in education.



## CHAPTER VI. IMAGINATION, MEMORY, ASSOCIATION

### Lesson 20. Imagery and Imagination

As we turn from sensation and perception to imagination we are turning from a study of present experiences to past (or possible future) experiences. Impressions made upon the mind by the outside world remain in consciousness as images; they affect our behavior markedly even after the experience is long past. The "consciousness" psychologist is inclined to class images with sensations and feelings as making up the elements of all other higher mental processes. We are concerned with getting a clear idea of these processes and their significance for memory and thought in particular. Images are the stuff out of which dreams and hallucinations are made largely. This is a very interesting by-path that some one may want to follow.

References: Strayer and Norsworthy, ch. 6; Colvin and Bagley, ch. 13; James, ch. 19; Colvin, chs. 7, 8; Norsworthy and Whitley, ch. 9; Angell, pp. 196-206, 214ff.; Woodworth, ch. 19; Warren, ch. 8; Pillsbury, ch. 4, pp. 236-8.

1. Write out to hand in under the title, "My Mental Imagery," the answers to the questions following under A, B, and C in sufficient detail that one can get a good picture of your mental imagery:

#### A. Visual Imagery

Think of your breakfast or dinner table, as you sat down to it; call up the appearance of the table, the dishes, the food on it, the persons present, etc. Then answer these questions:

- (1). Are the outlines of the objects distinct and sharp?
- (2). Are the colors bright and natural?
- (3). Where does the image seem to be situated? In the head? Before the eyes? At a distance?
- (4). How does the size of the image compare with the actual size of the scene?

#### B. Kinds of Imagery

- (5). Can you call to mind better, the face or voice of a friend?
- (6). When "violin" is suggested, do you first think of the appearance of the instrument or the sounds made when played?
- (7). Can you call to mind clearly the following and, if so, name the kind of imagery: (a) sight of natural scenery, (b) sound of music, (c) taste of fruit, (d) movement of a boat or hammock or swing, (e) odor of a rose, (f) strain of lifting some heavy object?
- (8). What kinds of images, concrete or verbal, i. e. of things or words, are suggested to your mind by the words, (a) dog, (b) railroad, (c) write, (d) pull, (e) storm, (f) infinity?

#### C. Conclusions

Write out a brief summary of the kind of images you seem to have. Are they largely visual or largely of some other kind? Do you seem to be strong in imagery or not?

2. What is an image? cf. to percept? What is imagination?
3. Distinguish between concrete and verbal imagery. What type is the little child more apt to have? The uneducated adult? The scientist? Are some studies likely to call for one type and other the other?
4. Imagery is usually classed as reproductive and productive (or creative). Is the work of the inventor likely to demand one more than the other? Of the teacher? Of the young student? Of the advanced and older student in a subject? What bearing has productive imagination on the world's progress?
5. What are the general traits of the imagination of the little child? What is the import of these for teacher and parent? Should the child's imagination be developed? What of the use of "fairy tales"?
6. What definite educational principles have you discovered or thought out in this lesson, e. g. regarding the use of imagery in study?



## Lesson 21. Memory and Its Different Phases

Memories or memory processes are very closely allied to imagery and imagination. We probably remember largely in terms of images whether we are aware of it or not, that is, images are the materials out of which memories are made. It is doubtful if many topics are more fruitful or practical to the student than this; therefore, for the sake of your future success as a teacher, in instructing others to use correct habits of memorizing, but also for your own economy of time and your own efficiency, you will do well to study this and the three succeeding chapters with unusual care and thoughtfulness.

References: Woodworth, ch. 14; Strong, chs. 11, 13, 17; Pillsbury, ch. 8; Warren, ch. 8; Angell, ch. 9; Pyle, ch. 7; Norsworthy and Whitley, ch. 8; in each case study parts related to the questions.

1. Would you say that you have a good memory or a poor memory? How does it compare with some one's else, that is do you know some fellow student who seems to have a much better memory? Can you account for this? You will want to study two matters in this and succeeding lessons, (a) the complexity of the memory process (so that your memory may be good in one line and poor in another), and (b) the problem in what ways you can and cannot improve your memory.
2. Reviewing your study of imagination, which type of imagination would you say is practically identical with memory? How, in general, does memory differ from imagination? From sense-perception? Illustrate your answers by concrete experiences as far as possible. State what the term designates.
3. The psychologist finds four overlapping but different processes involved in memory; learning (or memorizing), retention, recall, and recognition. Familiarize yourself with the meaning of these terms and find an out-of-school and an in-school experience, each illustrating these four phases. Note also how sometimes you have the experience of one of the processes failing to function when others do, for example, recognition without recall.
4. Is forgetting natural? Is it entirely disadvantageous? Why? What have psychologists found out about the rate of forgetting? Does this agree with your experience? (This is the first time that you have come upon the use of graphing in psychology but you will want to use this from time to time in the future. Try, therefore, to understand what the curve of forgetting means, and to be able to draw and explain it).
5. The instructor will give a test with numbers, letters, nonsense syllables, or unrelated words to find out the individual differences and to measure the memory span of each member of the class during the class period. Find out what is meant by the term, something of its importance at least in diagnosing the probable school achievement of children, and also find out something of the differences between children and adults in this regard. Apply this principle of difference of child and adult to memory in general and note that the current popular view about children's memories, as many popular views about psychological matters, is incorrect.



## Lesson 22. Types or Kinds of Memory

In this lesson we shall pursue further the study of the nature of memory. It would be well to first clear up any problems or difficulties with the preceding lesson as far as possible. The first exercise is intended to be completed after you have done this. Many interesting problems raised here will be answered largely in the study of the learning process in the course in educational psychology when we shall connect up the general problems of psychology with learning, and when we shall more definitely keep in mind the bearing of psychology upon school work.

References: See lesson 21.

1. Fill in the incomplete statements below, first without help of any fellow-student, or any other help. Then check your answers and see how far you are correct.  
Memories are dependent to a large degree upon.....just as ..... depend upon sensations. While children appear to learn ..... than adults, this is due to their..... There are at least four processes in, or phases of, memory, namely,.....,....., and..... Forgetting is as natural a process as remembering, and the curve of forgetting drops..... at first and then.....later on.
2. In the last lesson you learned something about the term memory span and you also found your own span in relation to that of the class and of adults and children in general. This type of memory is known as primary (immediate) memory. What is the psychologist's explanation of primary memory? Would secondary memory or retention be illustrated by the fact that you might perhaps remember one or more of these combinations today? Is cramming related to primary memory? When is cramming not wholly an unmitigated evil, e. g. with the student, the teacher, the lawyer, the minister?
3. Distinguish between two other kinds of memory, namely, rote and logical memory. Which of these is natural to the child and distasteful to the average adult? Why? Which requires forming new bonds and which uses old bonds? Which, therefore, is more economical?
4. The instructor will give a brief test in logical memory and the results can be measured alongside those of the memory span which, while a test of primary memory, is likewise a test of rote memory. In other words, you will be able to tell something about your status in regard to having a good memory or a poor memory if you rank high in both, or low in both, or medium in both. You may rank high in one and low in the other. What would this mean? Should a teacher rank high preferably, in rote or logical memory? A mail clerk or carrier? A telephone operator? A salesman?
5. The instructor will also give a test to show what the factors are in associative memory. The experiment will prove very interesting and will give you an insight into the way you remember when you do remember, that is, what are the causes of retaining, recalling, and recognizing. (Test adapted from Strong, ch. 14).



## Lesson 23. Association: the Laws (Factors) in Association

The term association was once regarded by psychologists as offering the solution of most problems of psychology, and as being a fundamental principle of mental life very much as is the law of gravitation in the physical world. Today we are inclined to look upon association as being a phase of all consciousness (or behavior) very much as is attention, and of its relationship as being closer to imagination and memory than to other mental processes. The newer view also considers the term as a practical equivalent of the term bond so that today we are really raising the question that is phrased by Strong, as follows: "What are the factors that affect the strength of the bond?" Bonds, connections, and associations, there must be, or situations would not call out the same or similar responses. One can scarcely imagine what sort of mental life if any, we could have under those circumstances.

References: Strong, chs. 14, 16; Colvin, ch. 10; Pillsbury, pp. 146-157; Thorndike, E. P., pp. 238-250; Angell, pp. 206-214; Woodworth, ch. 15.

1. If I suggest to you the word "apple," and you immediately think of or associate with it the word "tree," you no doubt do so because you have associated them together some time in the past. Otherwise, some other response would have been made. Note similarly the response called up by "2 times 2," "the capital of Virginia," "discovery of America," or "289R." Take the following words and write down the first 10 words or ideas (associations) that come successively to mind: horse, storm, synapse, fruit. Can you account for these situations? (See exercise 3 below). Do you note a very real difference in certain lists as compared with others? What is free association? Controlled association?
2. What then, is association? How does the term differ in meaning from the term bond? Do associations exist in rote learning or memory as well as in logical? Look back to your list of situations and responses in Lesson 5, and note the associations that account for the responses in a number of cases.
3. Returning to the experiment in exercise 5, lesson 22, study carefully each of the responses, noting the factor that caused your answer to be correct or incorrect. Familiarize yourself with Strong's discussion and try to bring to class at least one good illustration of each of these factors out of your recent experience.
4. Which of these factors are of great importance in the work of the school? Which are of second-rate importance, and which of very doubtful value? Which are greatly neglected in current school practice? Which should you heed very much more than you have been doing for the improvement of results and economy of time in your study?
5. Write and bring to class not more than a page of this note-book paper (nor less than a half page) of untechnical discussion of the terms, imagination, memory and association, to show that you have a clear notion of these concepts and their relatedness.
6. What may be said to be the general law of association (see indexes of various texts or Thorndike, E. P., p. 207); cf. the notion of apperception? This may also be considered as the general law of habit forming, which is a related topic that can be discussed here or left to the course in educational psychology.



## Lesson 24. Review of Memory and Association: Practical Applications

This lesson, like the last question of the previous lesson, aims to assist you in summing up and clinching the main ideas of the last four lessons. It also aims to help you to fix certain very practical maxims of memorizing. It is probable that the instructor will want to supplement this review with a written lesson at the next period, this to act as a means to a review of the work beginning with lesson 14. The practical problem for you as a student is whether you make sure that your habits of memorizing are overhauled as a result of this study.

References: Colvin, ch. 11; Strayer and Norsworthy, ch. 5; Pillsbury, ch. 8; Freeman, pp. 193-204. See also lessons 20, 21, 23.

1. Learn what you can about the experimental findings of psychologists regarding the effects of sex and age upon memory. Would the law of variation sometimes outweigh the factor of sex? At what age are children likely to enjoy verbatim memory work? Why?
2. You have found the question of a "good memory" resolving itself into the matter of (a) natural retentiveness which probably cannot be affected by education any more than the color of one's eyes, and (b) improved methods or habits of memorizing. What have been found to be the secrets of this improvement? (See Strayer and Norsworthy) Cf. also exercise 5 below.
3. What are the advantages or values in memory systems which you frequently see advertised in the magazines? Of mnemonic or mechanical methods of memorizing? Illustrate. What pitfalls lie in both? And what is after all the best single system?
4. Going back over the last four lessons, make a list of four or five definite facts that have been rather well established by scientific investigation in the field of memory. This is a field in which much work has been done that really bears upon formal or informal education. Couch your statements briefly and see if they do not stand as laws of memory. (Cf. lesson 15, exercise 2).
5. If you were to be given the task of learning a poem of twenty lines or a prose selection of similar length, what are the most valuable rules and maxims that you could use to make your memorizing effective? You may be able to build these rules in a better order, perhaps around some such cue-words as the following: meaning, recitation, repetition, distribution, wholes, association, threshold. What others should be added? Which of these rules would not hold as well of learning history, mathematics, spelling, home economics, or psychology? Which do you need to bear in mind to make your work more efficient?



## CHAPTER VII. REASONING AND THE PROCESSES INVOLVED IN REASONING

### Lesson 25. General Nature of Reasoning (Thinking)

Someone has said, "Animals never reason and man seldom." However, simpler forms of thinking and the exercise of the various mental processes involved in thinking are of frequent occurrence, even if the more elaborate problem-solving is largely left to a few individuals.

You will find this and the succeeding chapter harder than usual unless you check up your readings carefully with your own experiences as you have been asked always to do. There has comparatively little been done in experimenting with the reasoning process as compared with memory and, therefore, introspection is the more important. The best book on the subject and one that you will want some time to have a mastery of, is Dewey's "How We Think;" this book is largely an analytic study rather than experimental, but it has influenced all later writers on psychology and education decidedly and if you were to master this one book you would have a splendid background for masterful teaching.

References: Strayer and Norsworthy, ch. 7; Warren, ch. 13; Strong, chs. 38, 39; Woodworth, ch. 18; Angell, 10, 11; Norsworthy and Whitley, ch. 10; Pillsbury, ch. 9; James, ch. 22; Freeman, ch. 11; Colvin, chs. 20-22. Dewey's "How We Think" is referred to in connection with some of the exercises. See also Miller, "The Psychology of Thinking," and Boraas, "Teaching to Think".

1. What are some of the different meanings that people give the term thinking? Are some of them incorrect? Does it seem to bear a close relation to association? What is the distinct characteristic, if any, in reasoning? When and why do humans reason? Do animals reason? Why are such responses relatively infrequent in our mental life?
2. Study the illustrations of thinking (reasoning) in Dewey's H. W. T. (pp. 68-72), tracing out the steps in his illustrations. Then write out to hand in, some fairly recent experience of your own in thinking, noting in the write-up the steps of Dewey. Could one of these steps be slighted or omitted in some bits of reasoning and the conclusions be valid? What is meant by "reasoning a thing through"? Do we often stop short of the end? What is meant by the statement that "it takes time to think"? Is this principle frequently violated by teachers?
3. How can inductive and deductive thinking be distinguished? Which is the more natural with children? Which with an adult who is thinking regarding familiar lines of experience, e. g. his vocation? Do both of these types take place in your illustration above? Cf. grammar, nature study, home economics, algebra, history, this course in psychology? Can you in each case suggest how a better or different organization of the course would require more variety of use of these two types? Or a change in emphasis from one to the other?
4. Before you leave this matter, write out a brief summary of this discussion in which is included: thinking, reasoning, the steps, induction and deduction. Are you yourself addicted too much to the habit of accepting the conclusions of others as your own, without thinking them out, or without, when possible, arriving at these conclusions yourself?



## Lesson 26. Processes Involved in Reasoning: Practical Applications

Just as emotions are inconceivable without feeling and percepts without sensations, so reasoning must be thought of as a complex of many processes including concepts, judgment and inferences. It becomes the whole business of logic, a sister science of psychology, to deal with the results of reasoning, the statements and arguments such as we find in texts and other books, and to establish norms by which to judge the correctness and validity of such arguments. In this lesson we are to see on the other hand, how these various processes dovetail into one another and to draw therefrom a list of valuable suggestions for our own thinking and for our training of others to think.

References: See lesson 25.

1. When you think of, have an idea of, say a "horse" or horses in general, without at the time any sensory experience (percept), this generalized experience or process is known as a concept, or meaning. You will remember that a sensation became a percept when some meaning was attached to the object, so now the concept represents this meaning come so fully into its own, that it can replace the object itself in our thinking. Does this concept of horse carry with it an image of some one horse or horse-ness in general? Is it necessary for it to do so? Briefly, what is a concept and the process of conception? Note how this process is a tremendous time-saving device which probably animals have in a very small degree and that our concepts not only grow in our own experience (ripen and develop), but also in the race's experience? Illustrate.
2. Not only does reasoning require concepts (meaning, facts) as the raw material but it draws conclusions, arrives at solutions or makes inferences. Already in exercise 3, lesson 25, we noted the double process of inference. Could we say that inferring is the response of interpreting the relation of concepts? (See Dewey, pp. 82-83, and Woodworth, pp. 465-8, 474-5). Is the process of inference essential for the development of clear workable concepts? That is, do the two kinds of responses go hand in hand? Illustrate. Show how in this course you have been, by means of the exercises and problems, engaged not in elaborate problem-solving but rather in developing concepts and making inferences. How does typical textbook study utilize these responses? In a somewhat different degree or with a different emphasis?
3. Do not memorize the following general maxims about thinking in relation to school work, but think them over carefully, try to illustrate them, and to apply them to your own work as a student (cf. Colvin, ch. 22; Strayer and Norsworthy, ch. 7).
  - i. Abstract thought (reasoning) is a capacity that is possessed in varying degrees and in some persons to a very small degree.
  - ii. Reasoning demands data sufficient to solve the problem (if the pupil does not possess the facts, they must be gotten from texts, from the teacher, from observation or other legitimate sources).
  - iii. Reasoning and the rational life require as attitudes, open-mindedness, self-criticism, and originality.
  - iv. Training is essential at each step in the thinking process, in defining the problem, in analyzing it into its different elements, in evaluating the tentative solutions, and in verifying the accepted answer.



## CHAPTER VIII. WILL AND CHARACTER

### Lesson 27. Will, Voluntary Action, Character, Moral Training

There was a time when psychologists had a conception very much like the popular one of today that the will was a separate faculty of the mind which acted as a sort of commanding general of the other faculties or processes. Today we conceive willing or volition as being a counterpart of attention and characterizing our mental life when action follows along the lines of our choices, ideas, ideals, and intentions. Our character or moral life is a complex of these ideals and habits that we more or less consciously develop. It is therefore exceedingly important for your personal happiness and influence to get the proper notion of will and its training.

References: Pillsbury, pp. 346-356; Strayer and Norsworthy, ch. 11; Norsworthy and Whiley, ch. 13; Angell, ch. 22; Averill, ch. 39; Thordike, E. P., pp. 276-284, 293-6; Dewey, M. P. E.; Woodworth, ch. 20; Warren, chs. 12, 15.

1. Some of our acts are planned more or less and others not. What is the actual difference? Has this anything to do with will? Look up the hypothetical experience in Lesson 3 and note the place of willing there. What willed or voluntary action has characterized your behavior today? What do you understand by the psychologist's statement that the will is "the whole mind active?" (Angell, p. 435). Try to state as simply as possible what you regard as the meaning of the term will or volition.
2. Note the meaning of the following terms: desire, choice, wish, decision, conflict, intention, determination, effort. Can you suggest other terms that have to do with willing? Could you arrange these in a series?
3. It has been stated that "What holds attention determines action" (James, p. 448). Illustrate this. Does this hold of the so-called inattentive child in school? Does emotion enter in to determine will or choice? Does habit? Try to take some experience where you have made an important decision and note the presence of these three factors and others that may be present. Is will more characterized by suppressing or by expressing one's self? Does your answer agree with the popular notion?
4. What is meant by character? In how far is it a question of habits and ideals? What does it mean to have an impulsive will? an obstructed will? a healthy will? i. e. while these phrases are now unacceptable, what is the idea behind each and how does it connect with character?
5. What is will training? Which is more likely to further character training or development of the will, (a) moral instruction in what constitutes good citizenship or (b) participation in student government? Why? What is the weakness of moral instruction that is, teaching precepts, or "preaching" in school? Would you rule it out? Why is the teacher's example followed and her precepts ignored?
6. Bearing in mind that the modern view is that the little child when he comes to school is largely non-moral, what suggestions have you to make to show that Dewey is right in saying that there are three sources of moral education or moral development in the school, the studies (curriculum), the methods used by the teacher, and the school life itself? What are three or four of the most important rules or maxims for the teacher to hold in mind as summing up the practical aspects of will training or moral education? Or what are the general notions you need to bear in mind if you wish to develop strength of character?



## CHAPTER IX. GENERAL PROBLEMS: RELATEDNESS OF FUNCTIONS, SELF, MENTAL DEVELOPMENT

### Lesson 28. Interrelations of Mental Functions: Personality, Self

You will recall that at the beginning of the course you were told that there was an older and false view of mind, namely that it was composed of a few rigid and separate faculties. On the other hand we now conceive it to be in reality a unit, despite the millions of responses that we perhaps daily make, like a great machine in respect to behavior but frequently and usually conscious of its behavior. While therefore we continue to use much the same terminology as the older view, e. g., memory, emotion, and so forth, we do this to help in analyzing this complex mechanism and to indicate how at one time it focusses in one way and at another time in another way. Oftentimes the labels do not fit well and could be shifted about without much difficulty. Reasoning is like will (involving deliberation), like memory (depending upon recall), like imagination (using images ordinarily), like association of ideas (and almost identical in its simpler forms), and is indeed based similarly upon heredity or natural tendencies. Today we want to think a little while about this general relationship of mental functions or processes and of its bearing upon two interesting problems: (1) the transfer of training from one function to another (exercise 2), and (2) the meaning of the terms self and personality (exercise 3).

References: Pillsbury, ch. 15, 17; Colvin, pp. 241-6; Strayer and Norsworthy, ch. 12; Woodworth, ch. 21.

1. Show, as with reasoning above, how perception connects up with most of the various processes or functions discussed in preceding lessons. Does this interrelation seem to hold of attitudes and emotions? Pillsbury maintains that there are three general functions of mind, which you have noted in connection with your study of situations, bonds and responses: receiving impressions, retaining impressions, and selecting among these. Are these three in evidence when I perceive a falling star, decide to walk instead of ride, remember the face of a friend in a crowd, etc.? Can you make other analogies than the one in the introduction which suggest the **unitary nature of mind**? Does this idea of interrelationship really clear up matters for you compared with your notions before studying psychology? Why is it important for the teacher?
2. If functions are so definitely and closely interrelated, when and why, if at all, does training carry over from one to another, e. g., memorizing poetry and prose, being accurate in arithmetic and writing and keeping accounts and in one's statements about other people? Be careful to get the correct view of this matter if you cannot answer the above questions with certainty. Can general intelligence be trained by training one function? Can it be trained at all? Be able to state how transfer of training takes place according to recent studies of the problem.
3. Another problem which arises naturally is that of the **nature of personality or self**. Just as reasoning is the basis of the study of logic so the study of the self and the not-self is of philosophy. We are concerned only with getting a general and practical working notion of these terms. Try to describe some one's personality so that another will recognize the person. Do you find yourself using the terms that you have grown familiar with in this course, or other terms? What is personality? How does the idea differ from that of self? Do you have a concept of self (your self) very much as you have of tree or chair? Is it the result of "thinking together" your various experiences? (If you care to read about the self, see Pillsbury, ch. 17; Angell, ch. 23; James, ch. 12; Woodworth, ch. 21; Warren, ch. 16).



## Lesson 29. Mental Development: Different Stages of

Although there has not seemed opportunity or time to stress it, you have noticed from time to time references to the fact that mental development is a process that begins largely with birth and is never ended until death or at least until senility comes on. A new-born babe can see, at least it can distinguish light from dark, but it cannot reason; it has sensations but no percepts or concepts. Professor James has said that its experience must be that of a "big, blooming, buzzing confusion." However all these traits or functions we have been discussing begin to develop early, not appearing full-fledged at one time as many people seem to think.

Our school work is divided more or less along the lines of child development into primary, intermediate and high school phases. At this time it is well for you to stop and check up on the traits of children at these ages. The instructor will assist you and perhaps arrange one or more observations. He may want you to specialize upon one of these three phases or stages or to study each less thoroughly.

References: Norsworthy and Whitley, ch. 15; Cameron, ch. 15; Freeman, ch. 12; Bagley, *Educative Process*, ch. 12; for the high school period or adolescent period, consult Colvin, *Introduction to High School Teaching*, ch. 2 or Monroe, *Principles of Secondary Education*, ch. 7, or Averill, ch. 45. Kirkpatrick, in his *Individual in the Making*, has the most detailed account of the different stages of child development, if one will read it with care and remember that what is reported is largely a matter of careful observations with a single child or a small number of children.

1. There seems to be much evidence that general bodily development and mental development go hand in hand, e. g., note the changes that occur at puberty. Can you cite other illustrations of this fact? It is likely that if a child is retarded physically he will in the majority of cases be retarded mentally? In any study of children at different ages or stages, which would be more desirable to know, the chronological age (that is, his age in years and months) or his mental age (representing his actual mental development)? How would the latter be found?
2. Bagley calls the period from 6-8 the transition period, that from 8-12 the formative period, and that from 12-16 the adolescent period. Try to suggest other terms or to point out the traits prominent in these periods. Then follow up one or more periods with a careful study, centering a part or most of your thought in the following questions:
  - i. What are some of the better defined objectives (aims) of school work at this period?
  - ii. What are some of the most important instincts that are prominent at this period?
  - iii. What types of interest absorb the child's mind, vocational, scientific, social, play, etc.?
  - iv. What are some of the characteristics of his perception, imagination, reasoning, memory, attention, etc.?
  - v. What do you consider as some of the biggest problems of this period? If you are able to do so, observe one child carefully and write out a summary of your observations more or less along the line of the questions above.











